

The opinion in support of the decision being entered today  
is *not* binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* EDWARD J. A. POPE and KENNETH M. KRATSCH

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Appeal 2007-0911  
Application 10/058,808  
Technology Center 1700

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Decided: August 31, 2007

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Before PETER F. KRATZ, CATHERINE Q. TIMM, and  
JEFFREY T. SMITH, *Administrative Patent Judges*.

KRATZ, *Administrative Patent Judge*.

DECISION ON APPEAL

This is a decision on an appeal from the Examiner's final rejection of claims 7 and 8, the only claims that remain pending in this application. We have jurisdiction pursuant to 35 U.S.C. §§ 6 and 134.

Appellants' claimed invention is directed to a ceramic fiber product comprising hafnium carbide derived from a pre-ceramic fiber. Claims 7 and 8 are reproduced below:

7. Hafnium carbide containing ceramic fiber derived from a pre-ceramic polymer formed by a process comprising the steps of:

- a. melting a hafnium containing pre-ceramic polymer;
- b. extruding said polymer through an orifice to form fiber;
- c. cross-linking said fiber; and
- d. heating said cross-linked fiber under controlled atmospheric conditions at a temperature greater than 600 degrees centigrade to obtain a hafnium carbide containing ceramic fiber.

8. A ceramic fiber comprising hafnium carbide derived from a pre-ceramic polymer.

The Examiner relies on the following prior art references as evidence in rejecting the appealed claims:

Uemura	US 5,399,378	Mar. 21, 1995
Hilmas	US 6,355,338 B1	Mar. 12, 2002

Claims 7 and 8 stand rejected under 35 U.S.C. § 102 as being anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as being unpatentable over Hilmas. Claim 8 stands rejected under 35 U.S.C. § 102(b) as being anticipated by Uemura.

We have thoroughly reviewed each of Appellants' arguments for patentability. However, we find no reversible error in the Examiner's

rejections based on the arguments made in the Brief.<sup>1</sup> Accordingly, we will sustain the Examiner's rejections for the reasons set forth in the Answer, and we add the following for emphasis only.

“To anticipate a claim, a prior art reference must disclose every limitation of the claimed invention, either explicitly or inherently.” *In re Schreiber*, 128 F.3d 1473, 1477, 44 USPQ2d 1429, 1431 (Fed. Cir. 1997); *accord Glaxo Inc. v. Novopharm Ltd.*, 52 F.3d 1043, 1047, 34 USPQ2d 1565, 1567 (Fed. Cir. 1995). However, anticipation by a prior art reference does not require that the reference recognize either the inventive concept of the claimed subject matter or the inherent properties that may be possessed by the prior art reference. *See Verdegaa Bros., Inc. v. Union Oil Co.*, 814 F.2d 628, 633, 2 USPQ2d 1051, 1054 (Fed. Cir.), *cert. denied*, 484 U.S. 827 (1987).

Anticipation under this section is a factual determination. *See In re Baxter Travenol Labs.*, 952 F.2d 388, 390, 21 USPQ2d 1281, 1283 (Fed. Cir. 1991) (citing *In re Bond*, 910 F.2d 831, 833, 15 USPQ2d 1566, 1567 (Fed. Cir. 1990).

Arguments not made in the Brief are considered to be waived. *See* 37 C.F.R. § 41.37(c)(vii) (2006).

#### § 102(b) Rejection over Uemura

The Examiner has found that Uemura describes a ceramic fiber comprising hafnium carbide (HfC), which described fiber anticipates the

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<sup>1</sup> Our references to the Brief in this Decision are to Appellants' Brief filed on March 17, 2006. The Reply Brief submitted on September 27, 2006 was not entered for consideration by the Examiner as failing to comply with 37 C.F.R. § 41.41(a) (Communication mailed December 01, 2006).

hafnium carbide-containing fiber of rejected claim 8 (Answer 5 and 6, Uemera, col. 1, ll. 43-55, and col. 2, ll. 5-13).

Appellants contend that the Uemera disclose a carbon fiber having a ceramic coating (i.e., HfC) or a composite formed by reacting a carbon fiber with a carbide-forming element (i.e., Hf). Moreover, Appellants contend that the product fiber of Uemera is not derived from a pre-ceramic polymer.

The issue before us with respect to this rejection is: Have Appellants identified reversible error in the Examiner's anticipation rejection by the arguments asserted in the Brief? We answer this question in the negative and we affirm the Examiner's anticipation rejection over Uemura.

Rejected claim 8 employs the open transitional term "comprising", which leaves the product claim open to the inclusion of other components other than those specifically recited therein. *See Exxon Chemical Patents Inc. v. Lubrizol Corp.*, 64 F.3d 1553, 1555, 35 USPQ2d 1801, 1802 (Fed. Cir. 1995); *In re Baxter*, 656 F.2d 679, 686, 210 USPQ 795, 802 (CCPA 1981). Moreover, the product of rejected claim 8 is described, at least in part, by a process of preparing the same. In assessing the patentability of such a product-by-process claim, the product made is the focus of our inquiry, not the process itself. In this regard, the patentability of a product is a separate consideration from that of the process by which it is made. *See In re Thorpe*, 777 F.2d 695, 697, 227 USPQ 964, 965-66 (Fed. Cir. 1985); *In re Brown*, 459 F.2d 531, 535, 173 USPQ 685, 688 (CCPA 1972).

The claim 8 recitation concerning the derivation of the claimed product from a pre-ceramic polymer is a rather broad product-by-process limitation. In a case such as this one where Appellants are asserting a product distinction based on such a "derived from ..." process limitation it is

appropriate that Appellants bear the burden to establish that this derivation requirement would necessarily result in a product HfC-containing fiber that is patentably distinct from the HfC-containing fiber product of Uemura. After all, the Patent and Trademark Office is not equipped to manufacture and compare products.

Here, Appellants have not satisfied this burden by the arguments of counsel furnished in the Brief (Br. 9-11). This is because Appellants have not demonstrated that the HfC component of the fiber product of Uemura patentably differs from any HfC prepared from or derived from a pre-ceramic polymer. Moreover, Appellants' contention that a ceramic fiber is expected to be made principally of ceramic is not persuasive because the Specification does not furnish a definition for ceramic fiber that limits that term to a fiber made principally from ceramic.

Appellants' reference to a portion of the preferred embodiment description found at page 73 of the Specification as supporting the notion that the claim 8 product requires a structural ceramic fiber made substantially entirely of a ceramic material and could not include a composite fiber such as disclosed by Uemura within the scope thereof is without merit because claim 8 is not so limited. After all, during prosecution of a patent application, the claims therein are given the broadest reasonable interpretation consistent with the Specification as they would be understood by one of ordinary skill in the art. *In re Zletz*, 893 F.2d 319, 321-22, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989). However, it is inappropriate to read in limitations from the Specification, as Appellants would have us do here. *In re Paulsen*, 30 F.3d 1477, 1480, 31 USPQ2d 1671, 1674 (Fed. Cir. 1994).

In light of the above and for reasons stated in the Answer (pp. 5, 6, and 8), we affirm the Examiner's anticipation rejection of claim 8 over Uemura.

§ 102(e)/§ 103(a) Rejection over Hilmas

Each of the rejected claims 7 and 8 are drawn to a hafnium carbide-containing ceramic fiber product that is further described in terms of the process by which it is made with claim 7 providing several process limitations for forming the product from a pre-ceramic polymer.

The Examiner has found that Hilmas describes a composite fiber including a hafnium carbide ceramic-layer that is embraced by the products of each of claims 7 and 8 (Answer 4-5; Hilmas, col. 5, ll. 1-14, col. 7, ll. 10-19, Example 1).<sup>2</sup>

At the outset, we note that Appellants do not present any arguments against the Examiner's anticipation and/or obviousness rejections of claim 8 over Hilmas in the Brief. Accordingly, we summarily sustain the Examiner's rejection over Hilmas as to rejected claim 8.

With regard to rejected claim 7, Appellants contend that Hilmas does not disclose a structural ceramic fiber product, as allegedly required by claim 7. Also, Appellants urge that Hilmas does not disclose cross-linking a hafnium-containing polymer prior to pyrolysis and/or performing a step of melting a hafnium-containing pre-ceramic polymer in making the product HfC-containing composite fiber described therein.

Thus, the issue before us is: Have Appellants identified reversible error in the Examiner's anticipation and/or obviousness rejection over

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<sup>2</sup> Appellants do not dispute the availability of Hilmas as prior art to the appealed claims.

Hilmas based on the arguments made in the Brief. We answer that question in the negative and affirm the Examiner's anticipation and obviousness rejections over Hilmas for substantially the reasons set forth in the Answer and as further explained below.

Rejected claim 7 employs the open transitional term "comprising", which leaves the product claim open to the inclusion of other components other than those specifically recited therein. Moreover, the product of rejected claim 8 is described, at least in part, by a process of preparing same. In assessing the patentability of such a product-by-process claim, the product made is the focus of our inquiry, not the process itself. Where the prior art product appears to be substantially the same as the claimed product as the Examiner reasonably established here (Answer 4-7), the burden is on the applicants to establish with objective evidence that the claimed product is patentably distinct from the product of the prior art. *See In re Brown*, 459 F.2d at 535, 173 USPQ at 688. This burden has not been discharged by Appellants' arguments, as furnished in the Brief.

We are not persuaded by Appellants' arguments because Appellants have not established that the process steps recited in appealed claim 7 necessarily require a hafnium carbide-containing ceramic fiber that is a structural ceramic fiber that patentably differs from the hafnium carbide-containing fiber product of Hilmas. For example, appealed claim 7 does not require any particular amount or type of cross-linking to have occurred in the formation of the product such that Appellants' argumentation with respect to insufficient cross-linking resulting in low yields of ceramic carries any persuasive weight in establishing a patentable product distinction for the product of claim 7 (Br. 8). In this regard, we note that the low

ceramic yield during preliminary experimentation referred to in the Specification has not been established by Appellants as a patentable distinction for the product of claim 7 (Specification, p. 72, ll. 2-4).<sup>3</sup>

Concerning Appellants' argument about the claimed melting of a pre-ceramic polymer resulting in a patentable distinction in the product made, we note that this argument does not fairly address the Examiner's determinations respecting the description of a corresponding melting step in the formation of the fiber product of Hilmas, much less substantiate a patentable product distinction based on this claim requirement for a hafnium-containing pre-ceramic polymer melting step during the fiber product formation (Compare Br. 7-8 with Answer 4-7).

For the reasons set forth above and in the Answer, we affirm the Examiner's anticipation and obviousness rejections of claims 7 and 8 over Hilmas, on this record.

### CONCLUSION

The decision of the Examiner to reject claims 7 and 8 under 35 U.S.C. § 102 as being anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as being unpatentable over Hilmas; and to reject claim 8 under 35 U.S.C. § 102(b) as being anticipated by Uemura is affirmed.

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<sup>3</sup> Indeed, Appellants' Specification reports that "[m]ore study is needed to find optimal conditions for cross-linking..." (Specification, p. 72, ll. 9-11). This disclosure is hardly suggestive of a described, much less a claimed patentable improvement based on a particular degree of cross-linking employed in making the claimed product.



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No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED

sld/ls

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